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Research Article

Enhancing Numeracy Skills of Remedial Class Learners Through Multisensory Learning Strategies: An Action Research

Julie Ann C. Dela Cruz, Ralph Michael B. Condino, James Paul M. Sombilon, Jushua T. Tabasa, Roberto G. Sagge Jr.*

College of Education, West Visayas State University, Philippines

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**Corresponding author:*
E-mail:
robertosagge@wvsu.edu.ph

ABSTRACT

This action research aimed to enhance the numeracy skills of Grade 9 remedial learners at a high school in Iloilo Province through multisensory learning strategies. Recognizing the persistent struggles in mathematics among the remedial learners, the researchers implemented a three-week intervention using three distinct approaches: tactile learning through manipulatives, audiovisual learning through educational videos, and kinesthetic learning through movement-based games. Sixteen identified remedial learners participated in activities that engaged multiple senses to make abstract concepts more concrete and accessible. Assessment results showed a clear before-and-after improvement in numeracy performance, from a Week 1 baseline mean score of 14.44/40 (36.10%) to a Week 3 post-intervention mean score of 32.88/40 (82.20%), with kinesthetic activities yielding the highest impact—100% of learners scoring 50% and above by the end of the intervention (compared with 18.75% in Week 1 and 56.25% in Week 2). Student interviews confirmed that games, visual presentations, and active participation improved engagement, comprehension, and enjoyment. Simple incentives like snacks and sticker-based attendance cards further boosted motivation and consistent attendance. The data analysis highlighted that engaging multiple senses supports differentiated instruction, improves learning outcomes, and fosters a more inclusive and interactive environment for struggling learners. The study recommends regular integration of multisensory learning strategies, particularly kinesthetic learning strategy through movement-based games, in remedial instruction, along with incentives that sustain student interest. This research provides practical and evidence-based insights for educators seeking to transform traditional math instruction and support diverse learning needs in remedial settings.

Keywords: *Action research, Mathematics education, Multisensory strategies, Numeracy skills, Remedial class*

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Introduction

The academic journey of learners is often characterized by diverse challenges, especially for those who struggle to meet the expected learning outcomes. For many Grade 9 learners in a high school in Iloilo Province, remedial classes serve as a good opportunity to bridge gaps in knowledge and skills to provide them with tailored instruction to overcome academic difficulties. However, despite the availability of such interventions, many learners continue to face barriers that hinder their progress. This challenge is particularly evident in the Philippines, where the 2018 Programme for International Student Assessment (PISA) reported that Filipino learners ranked among the lowest in mathematics proficiency (Wang et al., 2023). The persistence of poor numeracy skills among secondary learners highlights a significant gap in mathematics instruction, particularly for those in remedial classes who face difficulties in grasping fundamental concepts, performing basic computations, and applying mathematical reasoning. These challenges often lead to math anxiety, low confidence, and disengagement from learning, which further widens the achievement gap. Teachers in a high school in Iloilo Province, and across the country report that conventional teaching methods, which heavily rely on rote memorization and direct instruction, fail to address the diverse learning needs of struggling learners, which emphasizes the need for innovative instructional approaches that actively engage learners.

In response to this issue, the Department of Education (DepEd) has underscored the importance of adopting research-based strategies to enhance mathematics instruction as part of its Basic Education Research Agenda. In the past decades, many educators widely applied teacher-centered strategies to impart knowledge to learners' comparative to student-centered strategies (Aragón-Ángel et al., 2024). Until today, questions about the effectiveness of teaching strategies on student learning have consistently raised considerable interest in the thematic field of educational research (Lynch et al., 2025). Moreover, research on teaching and learning constantly endeavor to examine the extent to which different teaching strategies enhance growth in student learning (Aragón-Ángel et al., 2024).

Research suggests that struggling learners benefit more from interactive and multi-modal instructional approaches that engage multiple senses that makes abstract mathematical concepts more concrete and accessible (Cuturi et al., 2021). One promising approach is the use of Multisensory Learning Strategies (MLS), which involve visual, auditory, kinesthetic, and tactile techniques to enhance learning. This instructional approach is grounded in the Orton-Gillingham method, which has been widely recognized for its effectiveness in supporting learners with difficulties in reading and numeracy by integrating multiple sensory inputs into the learning process (Stevens et al., 2021).

Beyond being a classroom strategy, multisensory instruction is supported by Multisensory Integration Theory, which explains how the brain combines (or "integrates") information from different senses to form a more stable and meaningful understanding of concepts. When learners simultaneously hear an explanation, see a representation, and physically enact or manipulate the idea, multiple neural pathways are activated, making abstract mathematical relationships easier to encode, retrieve, and apply. In this view, auditory cues can guide procedural steps, visual representations can clarify magnitude and direction, and kinesthetic experiences can provide embodied anchors for rules and patterns—together strengthening conceptual understanding and reducing cognitive load for learners who struggle with purely symbolic instruction (Cuturi et al., 2021).

Multisensory learning has been shown to be particularly effective in improving mathematics proficiency among learners with learning difficulties. Boaler et al. (2021) emphasizes that learners learn best when they can visualize concepts, manipulate objects, and actively participate in the learning process. Empirical studies further support this claim, indicating that multisensory approaches significantly improve student engagement, conceptual understanding, and retention of mathematical concepts. A study by Murtagh et al. (2022) found that learners exposed to multisensory mathematics

instruction demonstrated a 32% improvement in test scores compared to those taught through conventional methods. Similarly, Squires et al. (2024) reported that play and movement have many direct and indirect benefits on learning and overall development. In the Philippine context, Autida (2024) examined the impact of multisensory strategies in math instruction and found that learners who participated in interactive, movement-based activities exhibited higher motivation and improved problem-solving skills. Hariri et al. (2025) stated that high achievers in mathematics preferred kinesthetic learning style. Kinesthetic learners thrive in hands-on, experiential learning environments (Ha et al., 2024), which may contribute to their enhanced ability to grasp mathematical concepts and consequently achieve higher grades in this subject. These findings suggest that multisensory learning is a viable and effective approach to addressing numeracy difficulties among Grade 9 remedial class learners.

Implementing multisensory strategies in a remedial mathematics setting is further supported by their cost-effectiveness and adaptability. Multisensory instruction utilizes a variety of engaging techniques, such as visual aids, auditory reinforcement, kinesthetic activities, and tactile manipulatives. These strategies make learning more accessible to learners with different learning preferences, thereby fostering a more inclusive and effective learning environment (Clinton-Lisell et al., 2024). Additionally, the integration of multisensory strategies aligns with the principles of differentiated instruction, which allows teachers to tailor lessons according to learners' individual needs and learning paces. By incorporating techniques such as charts, mathematical storytelling, interactive discussions, hands-on materials, and real-world problem-solving scenarios, learners can develop a deeper and more meaningful understanding of mathematical concepts.

The study contributes to researchers understanding of how-to better support struggling learners in their educational journeys. By exploring the impact of multisensory learning strategies in Grade 9 remedial classes, researchers hope to identify strategies that can be scaled and adapted to other contexts. This research not only addresses an immediate educational need but also aligns with researchers' aspirations as future educators to create meaningful and transformative learning experiences for all learners.

Generally, this action research sought to measure the effectiveness of multisensory leaning strategies on remedial class learners' numeracy skills.

Specifically, this study seeks to answer the following research question:

1. What is the Grade 9 remedial class learners' level of numeracy skills after exposure to different multisensory learning strategies?
2. How do multisensory learning strategies influence student engagement and understanding in mathematics through their experiences?

Materials and Methods

Research Design

This study adopts the Kurt Lewin's Action Research Model (Safford et al., 2013), which follows a cyclical process of Planning, Acting, Observing, and Reflecting. The main goal is to implement and evaluate Multisensory Learning Strategies (MLS) to improve the numeracy skills of Grade 9 remedial learners. The intervention is conducted over three weeks, with each week focused on a specific sensory-based learning approach—tactile, audio-visual, and kinesthetic—to address the diverse learning preferences of learners.

In the Planning phase, the researcher identifies the problem of low performance in numeracy among remedial learners. To address this, MLS is selected as the primary intervention. Teaching materials, activity guides, manipulatives, and audiovisual resources are prepared in advance, along with a class attendance system using index cards and stickers to monitor student participation and consistency.

During the Acting phase, weekly strategies are implemented to enhance student learning of mathematical operations through various learning styles. Week 1 focuses on tactile learning using manipulatives such as number line charts with movable markers for addition/subtraction and counting strips for multiplication/division. Week 2 introduces audio-visual

learning through YouTube videos that explain operations on integers, supporting learners who learn best by watching and listening. Week 3 emphasizes kinesthetic learning with movement-based games where learners race to solve problems on the board, fostering engagement and friendly competition. To boost motivation, snacks are given after sessions and as rewards for participation. Attendance is monitored with sticker-filled index cards to encourage consistency.

In the Observing phase, data is gathered through post-tests, teacher observations, and audio-recorded interviews to assess participation, accuracy, motivation, and overall learning progress.

Finally, the Reflecting phase involves evaluating the effectiveness of each strategy based on assessment results. Student performance is categorized as Highly Effective, Moderately Effective, or Needs Improvement depending on whether they score 50% and above in the post-assessment. If results suggest limited impact, modifications such as combining strategies or providing additional support will be considered. At the end of the three-week period, an interview with the learners is conducted to gather their insights and reflections on the multisensory strategies to further enrich the data and to inform future instructional improvements.

The summary of the process done in each stage is shown at figure 1.

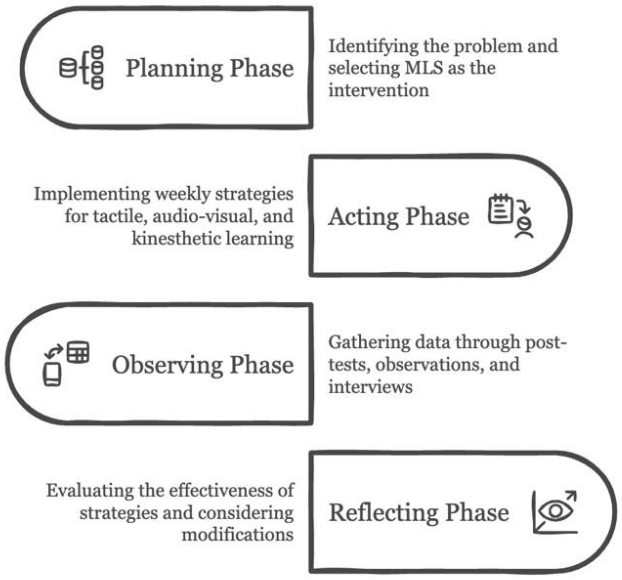

Figure 1. Kurt Lewin's Action Research Model

The participants of this study consist of 16 learners from the Grade 9 remedial mathematics class of a high school in Iloilo Province. They were selected through purposive sampling to ensure that the study focuses on learners who demonstrate persistent difficulties in numeracy skills. In this school context, placement in the remedial class is determined by the Mathematics Department using a combination of (a) documented low performance in prior mathematics assessments and quarterly performance tasks/examinations (i.e., performance below the school's passing standard) and (b) teacher-made diagnostic/placement checks aligned with the DepEd learning competencies for integer operations, complemented by teacher recommendations based on observed learning difficulties. The participants were therefore not selected based on national or regional achievement test cutoffs; rather, they represented the learners formally identified by the school as needing structured remedial numeracy support.

Moreover, names used in this study were pseudonyms to protect the identity of the learners.

Data Gathering Methods

Data gathering in action research is typically organized into three phases: pre-intervention, intervention, and post-intervention. Each phase is important in systematically collecting information to assess the effectiveness of the intervention and support the study's objectives.

The study did not administer a separate pre-test because the participants were already identified and formally enrolled in the remedial class based on prior documented numeracy difficulties. Instead, the researchers used the Week 1 assessment (administered after the initial tactile strategy session) as the baseline performance reference, followed by Week 2 and Week 3 assessments to track progress throughout the intervention period. The test items were validated by subject experts to ensure validity and appropriateness for measuring numeracy skills.

Intervention Phase. The intervention was conducted over a three-week period, with each week focusing on a specific multisensory learning strategy tailored to the learners' learning styles. Week 1 emphasized tactile learning, where learners used manipulatives to understand operations on integers. For addition and subtraction, they worked with a number line chart featuring a movable walking man that acted as a marker to help visualize movements along the number line. For multiplication and division, they used counting strips, which allows them to count and group values based on the given problem. These hands-on materials made abstract concepts easier to understand through physical interaction.

In Week 2, the strategy shifted to audio-visual learning. During this week, learners watched YouTube videos related to integer operations, which were played on a television (TV) inside the classroom. These videos presented mathematical procedures using clear visuals and narration, helping learners absorb information through both sight and sound.

Week 3 focused on kinesthetic learning. The learners were divided into two groups and participated in a classroom game where, in each round, one representative from each group would run from the back of the classroom to the board to write the answer to a given problem. The first one to write the correct answer won the round. This activity brought energy into the classroom and motivated learners through movement and friendly competition.

To encourage attendance, each student was given an index card where a sticker was placed for every day they were present. Snacks were also distributed after every session, and those who volunteered to answer during discussions received additional snacks as a reward, promoting both participation and consistency.

At the end of each week, a structured assessment was given to measure student progress. The assessment consisted of equations involving addition, subtraction, multiplication, and division of integers, with 10 questions for each operation. The task required learners to supply the correct answers, and the content remained the same each week to fairly evaluate the effectiveness of each learning strategy.

Post-Intervention Phase. Following the three-week intervention, the researchers collected and analyzed the learners' weekly assessment scores to evaluate improvements in their numeracy skills. Each student's performance across the three sets of assessments, administered after each weekly strategy, was carefully examined to identify progress and learning gains. By comparing the results, the researchers were able to determine which specific multisensory learning strategies had the most significant impact on student understanding and performance. This analysis helped in identifying which methods were most effective in addressing learners' difficulties with mathematics operations, thereby informing future instructional planning and interventions.

In addition to the quantitative data, the researchers also conducted interviews with the learners to gather insights into their learning experiences throughout the intervention. These interviews provided valuable qualitative data on how the learners perceived each strategy, what they enjoyed, what helped them learn best, and how they felt their understanding of numeracy had changed. The learners' feedback offered deeper context to the assessment results and highlighted the emotional and motivational impact of the multisensory learning strategies used.

Data Analysis

The type of data used in this study is primary data, which was derived directly from the results of the weekly assessments. The collected data were analyzed using descriptive statistics to determine the effectiveness of the intervention in improving numeracy skills. Weekly assessment scores of the 16 Grade 9 remedial learners were recorded and categorized based on three effectiveness levels. To evaluate the effectiveness of the intervention on learners' numeracy performance, the percentage of learners who scored at least 50% on the numeracy assessments was analyzed. Table 1 below presents the interpretation framework used to classify the results. This classification helps in determining whether the intervention was highly effective, moderately effective, or in need of improvement based on the proportion of learners who met the minimum performance threshold.

The assessment data were presented in tabular formats to visually illustrate the weekly progress of learners. In addition to quantitative data, qualitative data were gathered through student interviews conducted after the intervention to explore their learning experiences. These interviews were analyzed using thematic analysis to identify recurring patterns, insights, and reflections from the learners regarding the impact of multisensory strategies on their learning. The results helped in identifying which multisensory approaches were most effective in enhancing numeracy skills and how these strategies influenced learners' retention, engagement, and attendance.

Table 1. Effectiveness Scale of the Intervention Based on Student Performance

Range *(% of learners scoring ≥ 50%)*	**Description**	**Interpretation**
75% and above	Highly Effective	A significant improvement in learners' numeracy skills; the intervention should be maintained or expanded.
50% – 74%	Moderately Effective	The strategy is working but may need some adjustments to support more learners.
Below 50%	Needs Improvement	The intervention was not effective enough and needs to be revised or supplemented.

Result and Discussion

Level of learners' numeracy

The results illustrate the cyclical nature of Kurt Lewin's Action Research Model, showing continuous refinement of strategies until all learners reached at least 50% proficiency. The three cycles demonstrate how different multisensory strategies—tactile, audio-visual, and kinesthetic—produced varying levels of numeracy performance, offering insights into learner behavior, instructional design, and motivational factors.

Level of learners' numeracy in the 1st Cycle (Tactile Strategies)

Based on the data presented in Table 2, the Week 1 intervention using manipulatives was classified as "Needs Improvement", with only 18.75% (3 out of 16 learners) reaching 50% and above. Although tactile tools like number line charts and counting strips are commonly effective in remediation, the low performance suggests underlying issues in their use during this cycle.

A deeper analysis of the results indicates that the complexity of integer operations may have diluted the effectiveness of manipulatives. Unlike whole-number computation, integer operations involve direction, sign rules, and abstract reasoning that are not always intuitive even with concrete tools. For example, representing negative integers on number lines or visualizing multiplication of integers may have overwhelmed learners rather than supported them. Additionally, Week 1 served as the entry point of remediation, and students were still adjusting to routines, expectations, and confidence-building structures.

The low averages—4.50 (addition), 3.56 (subtraction), 3.31 (multiplication), and 3.06 (division)—suggest that learners struggled despite the hands-on materials. This implies that the manipulatives alone were insufficient to support conceptual understanding of integers at this stage, calling for multimodal reinforcement in subsequent cycles. Vallejo-Vargas and Reid (2024) discuss similar challenges when virtual manipulatives fail to produce expected gains in integer reasoning, highlighting the need for carefully scaffolded representational transitions.

Table 2. Assessment Results of Grade 9 Remedial Learners During Week 1 Intervention Using Tactile Learning Strategies (Manipulatives)

Name of Student	**Operation**				**Total Score**	**Classification**
	Add	**Subtract**	**Multiply**	**Divide**		
Andrew	7	3	6	5	**21**	50% and above
Charity	4	3	2	4	**13**	Below 50%
David	5	5	6	6	**22**	50% and above
Fredo	3	5	5	3	**16**	Below 50%
Jelian	4	3	6	6	**19**	Below 50%
Joerey	3	3	1	1	**8**	Below 50%
John Gabriel	2	3	4	3	**12**	Below 50%
John Mark	4	5	0	2	**11**	Below 50%
Jude	9	4	8	5	**26**	50% and above
Junlever	5	2	0	2	**9**	Below 50%
Kim Adrian	4	4	5	6	**19**	Below 50%
Kris Daniel	4	3	0	0	**7**	Below 50%
Kyan	6	4	3	2	**15**	Below 50%
Lester	6	2	0	0	**8**	Below 50%
Mikay	4	4	4	2	**14**	Below 50%
Xian	2	4	3	2	**11**	Below 50%
Average	**4.50**	**3.56**	**3.31**	**3.06**	**14.44**	**Below 50%**

Level of learners' numeracy in the 2nd Cycle (Audio-Visual Strategies)

Table 3 presents that Week 2 showed a marked improvement, with 56.25% of learners passing, indicating that audio-visual instruction—particularly video-based explanations—helped many students make conceptual progress. The videos provided structured steps, repeated demonstrations, and a consistent pacing that supported auditory and visual processing (Yang et al., 2022). A notable finding is that learners performed best in multiplication (6.06 average) and division (5.75 average), while addition remained the lowest (3.50). This operation-specific gain suggests that videos may have been more effective for teaching rule-based procedures (e.g., "same signs multiply to positive, different signs to negative") compared to addition and subtraction of integers, which require conceptual understanding of direction and magnitude on a number line.

The dynamic animations in the videos likely made multiplication/division rules clearer, while addition/subtraction may still have required a more tactile or movement-based explanation, which was absent in this phase. Although the average total score of 19.75 did not yet meet the 50% benchmark, the growth from Week 1 reflects that audio-visual strategies were "Moderately Effective" and increased both comprehension and engagement.

Table 3. Assessment Results of Grade 9 Remedial Learners During Week 2 Intervention Using Audio-Visual Learning Strategies (Videos)

Name of Student	Operation				Total Score	Classification
	Add	Subtract	Multiply	Divide		
Andrew	0	3	2	3	**8**	Below 50%
Charity	4	4	7	6	**21**	50% and above
David	8	5	9	8	**30**	50% and above
Fredo	1	6	7	6	**20**	50% and above
Jelian	5	6	3	4	**18**	Below 50%
Joerey	2	5	5	8	**20**	50% and above
John Gabriel	3	3	9	7	**22**	50% and above
John Mark	2	4	4	4	**14**	Below 50%
Jude	9	5	10	10	**34**	50% and above
Junlever	2	5	6	6	**19**	Below 50%
Kim Adrian	3	5	8	7	**23**	50% and above
Kris Daniel	4	4	7	7	**22**	50% and above
Kyan	4	4	3	5	**16**	Below 50%
Lester	3	4	6	2	**15**	Below 50%
Mikay	3	5	7	5	**20**	50% and above
Xian	3	3	4	4	**14**	Below 50%
Average	**3.50**	**4.44**	**6.06**	**5.75**	**19.75**	**Below 50%**

Level of learners' numeracy in the 3rd Cycle

Table 4 presents the Week 3 intervention using kinesthetic, game-based learning yielded exceptional results: all 16 learners (100%) reached 50% and above, with an average score of 32.88. This dramatic improvement highlights the strong alignment between kinesthetic activities and the needs of remedial learners. The success of this method can be attributed to three key elements: (1) Physical Movement – running to the board and solving problems created high-energy engagement, which is known to reduce anxiety and increase focus; movement also stimulates brain activation linked to memory and cognitive processing. (2) Friendly Competition – the structure of the activity allowed students to experience success in a low-pressure competitive environment, boosting confidence and motivation. (3) Team Collaboration – working in groups created peer support and reduced individual fear of failure.

Interpreting the three cycles together helps explain why the tactile and audio-visual strategies lagged behind kinesthetic learning for this specific group. For many remedial learners, tactile manipulatives can become another layer of complexity when the mathematical task already demands managing sign rules, directionality, and symbolic notation; without extensive scaffolding, learners may focus on "moving pieces" rather than on the underlying integer concepts. Similarly, audio-visual instruction supported procedural recall through repeated demonstrations, but it remained largely observational and offered limited immediate feedback, peer modeling, and opportunities to externalize thinking. In contrast, the movement-based games combined rapid practice, instant correctness feedback, social support, and heightened attention/arousal. These conditions are especially responsive to learners with low confidence and math anxiety because they transform problem solving into a shared, low-stakes, and embodied experience—thereby strengthening understanding and retention more effectively than passive or tool-heavy approaches.

These elements directly addressed the issues identified in the Introduction—math anxiety, low confidence, and disengagement. Kinesthetic learning replaced passive fear with active participation, making numeracy enjoyable and empowering. Petrigna et al. (2022) sum-

marize similar findings in their systematic review, showing that learning-through-movement and physically active academic lessons often improve academic outcomes, engagement, and related cognitive factors.

Table 4. Assessment Results of Grade 9 Remedial Learners During Week 3 Intervention Using Kinesthetic Learning Strategies (Movement-based Games)

Name of Student	Operation				Total Score	Classification
	Add	Subtract	Multiply	Divide		
Andrew	6	9	7	10	**32**	50% and above
Charity	8	8	10	9	**35**	50% and above
David	8	9	9	9	**35**	50% and above
Fredo	8	7	9	9	**33**	50% and above
Jelian	9	8	8	7	**32**	50% and above
Joerey	9	8	9	9	**35**	50% and above
John Gabriel	8	7	8	9	**32**	50% and above
John Mark	6	5	7	8	**26**	50% and above
Jude	10	9	10	9	**38**	50% and above
Junlever	8	8	7	8	**31**	50% and above
Kim Adrian	7	10	10	10	**37**	50% and above
Kris Daniel	9	7	8	9	**33**	50% and above
Kyan	7	6	9	8	**30**	50% and above
Lester	9	8	8	7	**32**	50% and above
Mikay	7	8	9	8	**32**	50% and above
Xian	7	7	9	10	**33**	50% and above
Average	**7.88**	**7.75**	**8.56**	**8.69**	**32.88**	50% and above

Role of Incentives in Strengthening Academic Gains

Across all cycles, incentives played a significant role in student participation. However, Week 3 demonstrated the strongest connection between incentives and academic performance. Snacks and rewards encouraged consistent attendance, and with full attendance came uninterrupted exposure to instruction and practice. This stability allowed learners to fully benefit from the kinesthetic activities, contributing to the 100% success rate.

While the study already recommends the use of incentives, the discussion reveals that incentives did more than motivate attendance—they created a positive emotional climate, increasing willingness to take risks, participate actively, and persevere through challenging tasks. This alignment between motivation and instructional strategy amplified learning gains and helped sustain student interest throughout the intervention.

Experiences of Learners

The insights gathered from the learners revealed valuable perspectives on what helped them enjoy, engage with, and learn more effectively during the intervention. These learners belonged to a remedial class and had previously struggled with mastering basic mathematical operations. The thematic analysis focuses on three major themes that emerged from the study: giving learners incentives, learning through games and board games, and the consistency of attendance. These themes highlight important strategies and factors that influence student engagement and academic performance. Providing incentives motivates learners to participate actively and strive for better outcomes. The use of games, especially board games, creates a fun and interactive learning environment. Lastly, regular attendance supports continuous learning and helps maintain classroom progress. Each of these themes underscores key motivational and instructional strategies that played a significant

role in increasing student participation, confidence, and learning outcomes, particularly for learners facing academic challenges.

Enhanced Enjoyment and Engagement Through Incentives

One prominent theme that emerged from the interviews with learners is the enhanced enjoyment and engagement they experienced as a result of receiving incentives such as snacks and small rewards during class sessions. These incentives, though not the core focus of the teaching strategy, played a supportive role in fostering a positive emotional environment that encouraged learners to attend class, participate in activities, and feel more excited about learning. The learners' responses reveal how these rewards, even in simple forms, contributed to increased classroom engagement and motivation.

Many learners directly mentioned how snacks made them feel more enthusiastic about attending class. Gabriel shared, "the snacks sir." in response to what he liked most about the class experience. This shows that snacks stood out as a positive part of his experience. When asked if he learned better and enjoyed the class, he confidently replied, "Yes sir." Joerey affirmed, "yes sir," when asked if he liked having snacks during the class. He added that even without snacks, he would still attend, but having them made the experience better. John Mark consistently nodded in agreement when asked if he liked having snacks and stated he would still attend even without them, suggesting that while not essential, incentives enhanced his enjoyment. Arbie expressed a preference for classes with rewards, "it would be better if there are rewards". He was asked whether he would still attend class without snacks, and he replied, "yes sir," affirming that learning remained the goal, but the snacks added excitement. Charity and Janas also responded positively when asked about the presence of rewards, noting that the class was "enjoyable", which was reinforced by the combination of enjoyable teaching methods and small treats. These responses reveal that incentives were seen as a reward for participation and an element of fun, helping maintain learners' attention and enthusiasm during lessons. Learners felt appreciated and cared for, which encouraged consistent participation and created a warm, inclusive atmosphere in the classroom.

These classroom observations align with broader research findings, which emphasize that both tangible rewards and the emotional value learners place on their learning experiences play a crucial role in sustaining motivation and engagement. In the Philippine context, Tolero and Echaure (2021) observed that reward systems, both tangible and intangible, positively influence learners' motivation and academic achievement in Science among secondary learners in the Botolan District, Zambales, further supporting the role of incentives in enhancing learning motivation and engagement in local educational settings. Moreover, Gorges et al. (2016) highlights the significance of intrinsic task value, showing that learners' perception of academic tasks as enjoyable and meaningful fosters greater intrinsic motivation and engagement. The positive emotional environment created by incentives can enhance learners' intrinsic appreciation of learning tasks, making them more likely to participate actively and persist in academic challenges. Together, these studies reinforce that both extrinsic incentives and intrinsic task enjoyment contribute significantly to positive learning experiences in classroom settings, particularly for learners who may struggle academically.

The use of incentives such as snacks played a meaningful yet subtle role in improving learners' classroom experiences. While learners expressed a willingness to attend and participate even without these rewards, their presence clearly boosted enjoyment and engagement. The incentives served as positive reinforcement, helping learners associate learning with fun and care. This theme highlights how thoughtful, simple gestures can make a lasting impact on learners' emotional connection to learning and their motivation to be active participants in class.

Active and Enjoyable Learning Through Games, Visual Tools, and Board Work

Classes are more enjoyable through activities such as interactive games, the use of TV for videos and PowerPoint presentations, and

hands-on practice, like writing on the blackboard. These interactive strategies made learning more engaging for the learners. The incorporation of diverse student-centered approaches captured the learners' attention and contributed to a deeper understanding of math concepts.

Several learners expressed that they thrived in environments where they could actively participate in class activities. For instance, Fredo mentioned, "when we are playing" suggesting that the games made the learning process more enjoyable. He further explained that he felt he could understand the material better when participating in these activities, emphasizing the value of interactive learning. Similarly, Jude highlighted his enjoyment of taking tests and actively engaging with the content, stating: "When we are taking the test". His positive attitude toward these more interactive learning forms indicated that, for him, active participation in class made the content more memorable. The use of visual tools like TV was also cited as an important element in enhancing understanding. Rhyza Mae affirmed that visual aids were beneficial for learning, stating, "I got the idea sir." This sentiment was echoed by others who found that watching TV presentations helped them grasp complex concepts. Arbie also pointed out that both games and TV viewing were vital in keeping learners engaged and making learning more enjoyable, which was important in making concepts clearer. Board work, where learners actively wrote and solved problems, was particularly highlighted as a crucial tool for active engagement. Joerey remarked, "they allow us to write on the board" indicating that the act of writing on the board helped him internalize the lessons. This sentiment was reflected across multiple responses, with many learners emphasizing the importance of writing down their solutions to reinforce learning.

These classroom insights illustrate how interactive strategies like games, visual presentations, and board work can enhance comprehension and retention, creating a more student-centered learning environment. This is supported by existing studies, which show that active and enjoyable learning in mathematics through these methods is a multifaceted approach that holds significant promise in improving student engagement and understanding. The integration of board games, such as the Setarea board game, has been effective in teaching set theory by allowing learners to engage in problem-solving both individually and cooperatively, resulting in improved understanding and higher flow experiences compared to traditional active-learning units (Debrenti., 2024). Similarly, game-based learning (GBL) has been shown to significantly boost motivation and reduce math anxiety among primary school learners, offering a departure from conventional methods by making learning more interactive and engaging (Yifan et al., 2024).

Building on this, the broader application of gamification and digital tools in mathematics education further emphasizes their transformative impact on student learning. The use of gamification in mathematics education has been widely documented to enhance student engagement and learning outcomes, as evidenced by studies showing improved academic performance and attitudes towards mathematics when gamified learning platforms are employed. Furthermore, interactive tools such as gamified e-books and online quizzes have been effective in simplifying complex mathematical concepts, thereby reducing student anxiety and enhancing comprehension. The use of physical and digital tools, such as the SMARTER tool and PhET interactive simulations, further supports the customization and personalization of learning experiences, making mathematics more accessible and enjoyable (Pan et al., 2022) and was mentioned in the study of Debrenti, 2024. Overall, these innovative approaches not only make mathematics learning more enjoyable but also prepare learners for future challenges by fostering critical thinking, problem-solving, and collaboration skills. The collective evidence underscores the potential of integrating games, visual tools, and board work in mathematics education to create a more engaging and effective learning environment.

The theme of active and enjoyable learning through games, visual tools, and board work demonstrates the positive impact of interactive learning strategies. Learners consistently noted that these methods not only made the

learning process more enjoyable but also enhanced their comprehension of difficult topics. Whether through solving problems on the board, engaging in class games, or benefiting from visual aids like TV presentations, learners experienced more effective learning when they were actively involved. This suggests that incorporating hands-on, participatory methods into teaching can significantly improve both student engagement and understanding.

Improved Learning and Understanding Through Consistent Attendance

Another key theme that emerged from the learners' responses is the link between consistent class attendance and improved learning outcomes. Several learners highlighted that attending all sessions of the two-week intervention helped them understand mathematical concepts more clearly. On the other hand, learners who were absent for some sessions reported limited understanding or only partial recall of the lessons. This theme emphasizes the value of consistent exposure to learning activities in developing learners' comprehension and retention of topics.

Fredo candidly shared, "I was only able to attend a few times" when asked about what he learned during the intervention, revealing that his limited attendance resulted in minimal learning. His experience reflects the importance of continuity in instruction, especially when lessons build on each other. In contrast, John Mark stated, "I can understand the lesson" and affirmed he had learned something during the class, likely due to his full participation in the sessions. This comparison highlights how regular attendance directly affects learning gains. Similarly, Arbie stated, "it seems like I learned a little, sir" suggesting that he gained some understanding, though it was not as comprehensive as it could have been. His response may reflect a partial attendance record, which possibly hindered a fuller grasp of the concepts taught.

Other learners, like Jude and Rhyza Mae, showed more confidence in what they learned, implying consistent attendance helped them absorb and engage with the material better. Rhyza Mae even emphasized that "I understood the lesson sir" the lesson when visual aids were used, and her confidence in understanding math increased. This reflects how consistency in engaging with such strategies contributes to better outcomes.

The connection between attendance and learning is further supported by Joerey, who expressed that even without rewards, he would still attend classes, indicating a value placed on learning itself. His motivation to attend despite the presence or absence of external incentives demonstrates the critical role of internal motivation, which is nurtured through consistent positive classroom experiences.

Consistent attendance has been shown to play a crucial role in learners' academic performance, even within the Philippine secondary education context. A study conducted at a national high school in Batangas City revealed that frequent absenteeism negatively affected fourth-year learners' individual learning and overall school performance. The study emphasized that regular class attendance leads to improved comprehension, active participation, and better academic outcomes (Swiderski et al., 2025). Similarly, research by Ha et al. (2024) found that junior high school learners in traditional class schedules, who attended classes more consistently, achieved higher grade weighted averages than those in double-shift schedules. Factors such as distance from home and peer influence contributed to higher absenteeism among the latter group, highlighting how consistent attendance, supported by favorable learning conditions, fosters academic success. These local studies support the observation that learners who attend regularly are more likely to understand and retain lessons effectively.

This theme underscores the significant role that regular class attendance plays in maximizing the benefits of educational interventions. Learners who consistently attended classes showed a deeper understanding and better retention of concepts, while those with inconsistent attendance faced challenges in keeping up with the lessons. This insight highlights the importance of creating an environment that motivates learners to attend regularly, ensuring each session is engaging and worthwhile. It also emphasizes the need for effective catch-up plans or additional support for learners who

miss classes, ensuring all learners have an equal opportunity to succeed and progress

Conclusion

The implementation of this Action Research at A high school in Iloilo Province served as a transformative journey that not only addressed the learning needs of remedial learners but also deepened our understanding of learner-centered teaching. The thematic analysis of our three-week intervention highlighted the critical role of multisensory strategies—such as games, visual tools, and board work—in enhancing comprehension and making mathematics more approachable. These approaches, paired with small incentives like snacks, created a more engaging and emotionally positive learning environment that encouraged student participation and enthusiasm.

Moreover, consistent class attendance emerged as a vital factor in learning success. Learners who attended regularly displayed better understanding and retention, underscoring the need to foster a classroom culture that promotes attendance and offers catch-up strategies for those who miss sessions. Despite the challenges we faced, particularly in motivating struggling learners and maintaining their attention, we learned the value of patience, creativity, and emotional support in helping learners overcome their academic difficulties.

This action research experience strengthened our belief that teaching must go beyond content delivery. It must be about connecting with learners, understanding their needs, and adapting strategies that speak to their diverse learning styles. Most importantly, it reminded us that when learners feel seen, supported, and actively involved, they are more likely to thrive.

As future educators, we carry forward the conviction that effective teaching is built on compassion, innovation, and commitment. With these values at heart, we are confident that we can transform our future classrooms into spaces where all learners—not just the high performers—are given the opportunity to succeed.

In terms of scaling and sustainability, the study further recommends the conduct of School Learning Action Cell (SLAC) sessions focused on multisensory and game-based numeracy remediation. Through SLAC, teachers can collaboratively design and peer-coach movement-based games and other low-cost gamification techniques (e.g., board work races, station challenges, and improvised manipulatives) so that effective remediation practices can be replicated across classes without requiring expensive equipment.

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